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Field of study: Network Protocols, Personal Communication Systems
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1. The Subject and Aims of Research

Computer Network Laboratory advances the state of the art in many computer communication and network disciplines. We are working in several emerging fields within both theoretical computer science and practical engineering applications. Our research focuses on the areas of communication protocol, wireless network, mobile communication system, and broadband wireless Internet access. Previous research topics in the last three years include wireless mesh network, sensor network, mobile wireless network, and software-defined radio applications, etc. Seven research projects have been completed. Research results are disseminated in eight leading journals and sixteen international conference proceedings. The primary project of the laboratory at the present time involves two topics. One is energy-efficient routing in wireless sensor networks. A second is media access control in wireless mesh networks, which QoS requirements are taken into account. In the future, the laboratory will conduct research into various ways of using wireless technology in practical applications. Several of our research topics cover integration of heterogeneous network, B3G wireless access network, wireless backbone network, ad hoc network, and pervasive computing, etc.

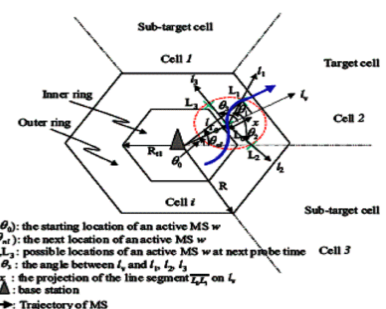
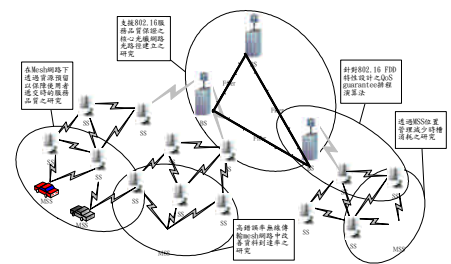
2. Related Recent Research Topics

Wireless mesh access networks

- Arrangement of fiber optic backbone networks
- QoS guaranteed scheduling algorithm
- High performance transmission strategies
- Support to mobile subscribers
- Location-awareness resource anagement policies

Mobile users in wireless communication networks

- Resource reservation schemes
- Handoff prediction schemes
- Channel allocation strategies

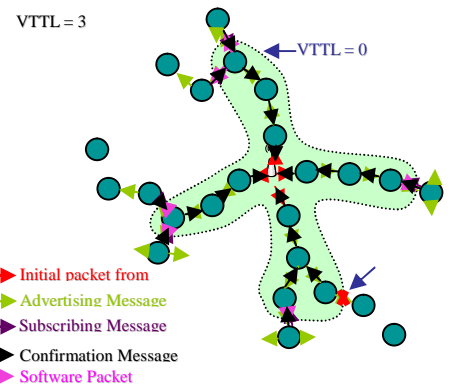
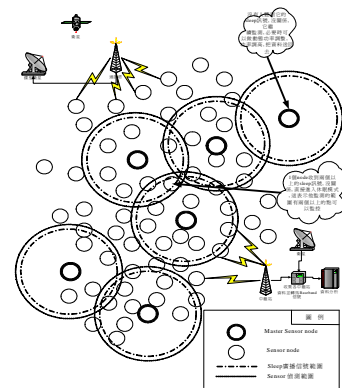


Wireless sensor networks

- Routing protocols for timely messages
- Power efficiency routing
- Service advertisement and discovery schemes

Applications of software radio

- Dynamic adjustment of channel coding scheme and working frequency
- New capability and services of satellites



3. Selected Publications and Projects

Publications:

- [1] Liu, H. H., **Wu, J. C.** and Lu, L. L., "The Study of Performance Enhancement for Integrated Voice/Data Wireless Networks by Link Adaptation," *Computer Communications*, Vol. 28 , No.5, p.519-528, 2005, **SCI (NSC92-2213-E-033-046)**
- [2] Lu, L. L., **Wu, J. C.** and Chen, W. Y., "The Study of Handoff Prediction Schemes for Resource Reservation in Mobile Multimedia Wireless Networks," *International Journal of Communication Systems*, Vol. 17, No. 6, pp. 535-552, Aug. 2004, **(SCI/EI)**
- [3] Shin, H. Y., **Wu, J. C.** and Liu, H. H., "Performance Analysis of a Dynamic multi-channel scheme with channel de-allocation in an Integrated Voice/Data Wireless Network," *IEICE Trans. On Fundamentals*, Vol.E87-A, No.7, pp.1681-1691, July 2004 **(SCI/EI)**

Projects:

- [1] NSC Grant, QoS Study in Wireless Mesh Access Networks , NSC94-2213-E-011-018
- [2] NSC Grant, Research on Enabling Techniques and Communication Protocols for Wireless Sensor Network Applications , NSC94-2213-E-011-009

NSC Grant, Smart Campus, NSC94-2218-E-011-011